

material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material, forming a plurality of layers from a combination of a first material and a second material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers...and impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.”

Cairns et al. do not describe or suggest a method for manufacturing a bearing element, wherein the method includes the steps of forming a plurality of layers from a combination of a first material and a second material, wherein a first layer is formed from a plurality of materials including at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second layer is formed against the first layer and is formed from a single material, and wherein each of the bearing element plurality of layers is plasma etched and impregnated with a polyimide resin including polytetrafluoroethylene powder. Specifically, Cairns et al. do not describe nor suggest plasma etching each of the bearing element plurality of layers prior to impregnating the layers with a polyimide resin including polytetrafluoroethylene powder. Rather, Cairns et al. describe a composite bearing structure including a backing member that is secured against a bearing surface layer that includes a solid lubricant and fibers. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Cairns et al.

For the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claim 11 be withdrawn.

The rejection of Claims 11, 13-17, 19, and 20 under 35 U.S.C. § 103 as being unpatentable over Stanley et al. (GB 2,095,170) in view of Cairns et al. (U.S. Pat. No. 3,781,205) is respectfully traversed.

Cairns is described above. Stanley et al. describe a composite article 10 in the form of a molded laminate bushing for use, for example, in a variable stator vane assembly. Bushing 10 is fabricated with a pair of outer bearing portions 12 and an intermediate lamination 14. Each lamination 12 is a compound woven fabric such as glass fibers and interwoven low friction fiber material such as PTFE fibers. Lamination 14 is a glass fiber element such as glass fiber clot.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Stanley et al. according to the teachings of Cairns et al. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Stanley et al. nor Cairns et al., considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Stanley et al. with Cairns et al. because there is no motivation to combine the references suggested in the art. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Stanley et al. is merely cited for teaching a bearing element wherein the first layer has glass fibers with Teflon, and Cairns et al. is merely cited for teaching a polyimide resin having PTFE particles. Moreover, neither Stanley et al. nor Cairns et al., considered alone or in combination, describe or suggest forming a bearing element from a plurality of layers from a combination of a first material and a second material, wherein a first of the layers is formed from a plurality of materials comprising at least one of Teflon fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of the layers is formed from a single material, in combination with the steps of plasma etching each of the bearing element plurality of layers and impregnating the bearing element with a polyimide resin comprising Teflon. Accordingly, Applicant respectfully submits that there is no suggestion or motivation to combine Stanley et al. with Cairns et al.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there

must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Further, and to the extent understood, neither Stanley et al. nor Cairns et al., considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 11 recites a method for manufacturing a bearing element comprising the steps of "forming a plurality of layers from a combination of a first material and a second material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers...and impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder."

Neither Stanley et al. nor Cairns et al., considered alone or in combination, describe or suggest a method for manufacturing a bearing element, wherein the method includes the steps of forming a plurality of layers from a combination of a first material and a second material, wherein a first layer is formed from a plurality of materials including at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second layer is formed against the first layer and is formed from a single material, and wherein each of the bearing element plurality of layers is plasma etched and impregnated with a polyimide resin including polytetrafluoroethylene powder. Specifically, neither Stanley et al. nor Cairns et al., considered alone or in combination, suggest plasma etching each of the bearing element plurality of layers prior to impregnating the layers with a polyimide resin including polytetrafluoroethylene powder. Rather, in contrast to the present invention, Stanley et al. describe impregnating the bearing laminate with a cured resin consisting of epoxies and polyimides, and Cairns et al. describe a composite bearing structure including a backing member that is secured against a bearing surface layer that includes a solid lubricant and fibers.

Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Stanley et al. in view of Cairns et al.

Claims 13-17, 19, and 20 depend directly or indirectly from independent Claim 11. When the recitations of Claims 13-17, 19, and 20 are considered in combination with the recitations of Claim 11, Applicant submits that dependent Claim 13-17, 19, and 20 likewise are patentable over Stanley et al. in view of Cairns et al.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 11-17, 19, and 20 be withdrawn.

The rejection of Claims 11, 13-17, 19, and 20 under 35 U.S.C. § 103 as being unpatentable over Stanley et al. (GB 2,095,170) in view of McCloskey (U.S. Pat. No. 4,111,499) is respectfully traversed.

Stanley et al. is described above. McCloskey describes a bearing liner formed of a mixture of thermosetting blended and unblended resins and particles of a self-lubricating, heat resistant plastic material, such as Teflon. The resin material is attached to a woven fabric formed of a plurality of materials including Dacron, Nomex, fiberglass, or aluminum foil. Pressure and heat are applied to cure the bearing liner and to lock the Teflon particles within the cured resin. At column 5, lines 1-3, McCloskey recites that “the Teflon particles are locked in the cured resin...the liner does not exhibit the “spring” which characterized prior art woven fabric liners.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify Stanley et al. according to the teachings of McCloskey. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. Neither Stanley et al. nor McCloskey, considered alone or in combination, describe or suggest the claimed combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Stanley et al. is merely cited for teaching a bearing element wherein the first layer has glass

fibers with Teflon, and McCloskey is merely cited for teaching a polyimide resin having PTFE particles. More specifically, neither Stanley et al. nor McCloskey, considered alone or in combination, describe or suggest forming a bearing element from a plurality of layers from a combination of a first material and a second material, wherein a first of the layers is formed from a plurality of materials comprising at least one of Teflon fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of the layers is formed from a single material, in combination with the steps of plasma etching the bearing element layers and impregnating the bearing element with a polyimide resin comprising Teflon. Accordingly, Applicant respectfully submits that there is no suggestion or motivation to combine Stanley et al. with McCloskey.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Further, and to the extent understood, neither Stanley et al. nor McCloskey, considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 11 recites a method for manufacturing a bearing element comprising the steps of "forming a plurality of layers from a combination of a first material and a second material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers...and impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder."

Neither Stanley et al. nor McCloskey, considered alone or in combination, describe or suggest a method for manufacturing a bearing element, wherein the method includes the steps of forming a plurality of layers from a combination of a first material and a second material, wherein a first layer is formed from a plurality of materials including at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second layer is formed against the first layer and is formed from a single material, and wherein each of the bearing element plurality of layers is plasma etched and impregnated with a polyimide resin including polytetrafluoroethylene powder. Specifically, neither Stanley et al. nor McCloskey, considered alone or in combination, suggest plasma etching each of the bearing element plurality of layers prior to impregnating the layers with a polyimide resin including polytetrafluoroethylene powder. Rather, in contrast to the present invention, Stanley et al describe impregnating the bearing laminate with a cured resin consisting of epoxies and polyimides, and McCloskey describes a bearing liner formed after a plurality of layers of materials are compressed into each other. Accordingly, for at least the reasons set forth above, Claim 11 is submitted to be patentable over Stanley et al. in view of McCloskey.

Claims 13-17, 19, and 20 depend from independent Claim 11. When the recitations of Claims 13-17, 19, and 20 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claim 13-17, 19, and 20 likewise are patentable over Stanley et al. in view of McCloskey.

For the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claims 11, 13-17, 19, and 20 be withdrawn.

The rejection of Claim 18 under 35 U.S.C. § 103 as being unpatentable over Stanley et al. in view of Cairns et al. and further in view of Viola et al. (U.S. Pat. No. 3,873,168) is respectfully traversed.

Stanley et al. and Cairns et al. are described above. Viola et al. describe a washer 10 including a pair of outer bearing portions 12 and a body 14. In the preferred embodiment, body 14 is fabricated from a layer of woven glass and a pair of layers of woven graphite. Viola et al. recite that graphite fibers facilitate providing thermal insulation to washer 10. Bearing portions 12 are bonded to each side of body 14 by a resin that is impregnated in each portion 12 and body

14. In an alternative embodiment, carbon fibers replace the graphite fibers. To facilitate enhancing the life and anti-friction characteristics of the outer surface of washer 10, a coating 18 is applied to bearing portion 12.

Applicants respectfully submit that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious to one of ordinary skill in the art to modify either Stanley et al. or Cairns et al. according to the teachings of Viola et al. More specifically, as is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. None of Stanley et al., McCloskey, or Viola et al., considered alone or in combination, describe or suggest the claimed combination. Rather, the present Section 103 rejection appears to be based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Stanley et al. is merely cited for teaching a bearing element wherein the first layer has glass fibers with Teflon, Cairns et al. is merely cited for teaching a polyimide resin having PTFE particles, and Viola et al. is merely cited for teaching an outer bearing portion including graphite and carbon fiber. More specifically, none of Stanley et al., Cairns et al., or Viola et al., considered alone or in combination, describe or suggest forming a bearing element from a plurality of layers from a combination of a first material and a second material, wherein a first of the layers is formed from a plurality of materials comprising at least one of Teflon fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of the layers is formed from a single material, in combination with the steps of plasma etching the bearing element layers and impregnating the bearing element with a polyimide resin comprising Teflon. Accordingly, Applicant respectfully submits that there is no suggestion or motivation to combine Stanley et al. or Cairns et al. with Viola et al.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the

present case, neither a suggestion nor motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Further, and to the extent understood, none of Stanley et al., Cairns et al., or Viola et al., considered alone or in combination, describe or suggest the claimed combination, and as such, the presently pending claims are patentably distinguishable from the cited combination. Specifically, Claim 18 depends from Claim 11 which recites a method for manufacturing a bearing element comprising the steps of “forming a plurality of layers from a combination of a first material and a second material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material...forming the bearing element from the plurality of layers...plasma etching each of the bearing element plurality of layers...and impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.”

None of Stanley et al., Cairns et al., or Viola et al., considered alone or in combination, describe or suggest a method for manufacturing a bearing element, wherein the method includes the steps of forming a plurality of layers from a combination of a first material and a second material, wherein a first layer is formed from a plurality of materials including at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second layer is formed against the first layer and is formed from a single material, and wherein each of the bearing element plurality of layers is plasma etched and impregnated with a polyimide resin including polytetrafluoroethylene powder. Specifically, none of Stanley et al., Cairns et al. nor Viola et al., considered alone or in combination, suggest plasma etching each of the bearing element plurality of layers prior to impregnating the layers with a polyimide resin including polytetrafluoroethylene powder. Rather, in contrast to the present invention, Stanley et al. describe impregnating the bearing laminate with a cured resin consisting of epoxies and polyimides, Cairns et al. describe a composite bearing structure including a backing member that is secured against a bearing surface layer that includes a solid lubricant and fiber, and Viola et al. describe a bearing element including carbon and graphite fibers. Accordingly, for at least the

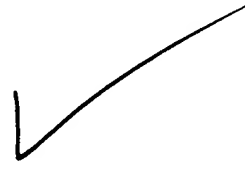



reasons set forth above, Claim 11 is submitted to be patentable over Stanley et al. and Cairns et al. in view of Viola et al.

Claim 18 depends from independent Claim 11. When the recitations of Claim 18 are considered in combination with the recitations of Claim 11, Applicants submit that dependent Claim 18 likewise is patentable over Stanley et al. and Cairns et al. in view of Viola et al.

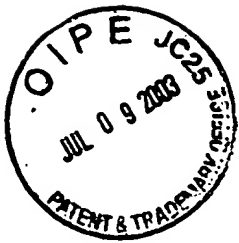
In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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13DV-14029  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Part #13

Applicant: Mesing et al.

Serial No.: 09/821,570

Filed: March 29, 2001

For: VARIABLE VANE SEAL AND WASHER  
MATERIALS

Art Unit: 3726

Examiner: Compton, E.

SUBMISSION OF MARKED UP CLAIMS

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Sir:

In furtherance of the response to the Office Action dated April 9, 2003 submitted herewith, Applicants hereby submit marked up claims in accordance with 37 C.F.R. Section §1.121(c)(1)(ii).

IN THE CLAIMS

11. (three times amended) A method for manufacturing a bearing element comprising the steps of:

forming a plurality of layers from a combination of a first material and a second material, wherein a first of said layers formed from a plurality of materials comprising at least one of polytetrafluoroethylene fibers, glass fibers, carbon fibers, and combinations thereof, and wherein a second of said layers is formed against the first layer and is formed from a single material;

forming the bearing element from the plurality of layers;

plasma etching each of the bearing element plurality of layers; and

impregnating each of the bearing element plurality of layers with a polyimide resin comprising polytetrafluoroethylene powder.

13. (once amended) A method in accordance with Claim [12] 11 wherein said step of forming a plurality of layers further comprises the steps of:

forming a first layer comprising the first material;

forming a second layer comprising the second material; and

forming a third layer comprising the first material.

Respectfully Submitted,



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